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Mineral Industry Surveys

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CHROMIUM IN AUGUST 2005

On the basis of gross weight, consumption of chromium ferroalloys and metal in August 2005 increased slightly compared with consumption in July 2005, according to the U.S. Geological Survey.

Included in this Mineral Industry Surveys are U.S. salient chromium statistics, U.S. Government stockpile inventory of chromium materials in August 2005, consumption by end use and consumer stocks of chromium ferroalloys and metal at the end of August 2005, U.S. foreign trade data for selected chromium-containing materials in July 2005, and chromite ore prices.

Update

The Defense National Stockpile Center (DNSC) announced that 3,629 metric tons (t) of ferrochromium, comprising 1,814 t of high-carbon ferrochromium and 1,814 t of low-carbon ferrochromium, was sold in September at a value of $3.8 million, or $0.48 per pound gross weight (Defense National Stockpile Center, 2005b). In its Annual Materials Plan (AMP) for fiscal year 2006, the DNSC set permitted sales of chemical and refractory grade chromite ore at 90,719 t each; ferrochromium at 99,790 t; and chromium metal at 454 t (Defense National Stockpile Center, 2005a).

Cocker (2005§[1]) reported that the biological monitoring of chromium in workers' urine is a useful way to assess occupational exposure to hexavalent chromium. He reports and compares various guidance values that help industrial hygienists interpret the analysis of biological chromium.

References Cited

Defense National Stockpile Center, 2005a, Annual Materials Plan for FY 2006: Defense National Stockpile Center, News Release DNSC-05-2669, October 4, 2 p.

Defense National Stockpile Center, 2005b, Stockpile announces ferrochromium sales for September 2005: Defense National Stockpile Center, News Release DNSC-06-2670, October 5, 1 p.

Internet Reference Cited

Cocker, John, 2005, Approaches to determining reference values for biological monitoring for chromium— The chromium file no. 13, International Chromium Development Association, accessed October 14, 2005, at URL http://www.chromium-asoc.com/publications/crfile13sep05.htm.

[1]A reference that includes a section mark (§) is found in the Internet Reference Cited Section.

TABLE 1
U.S. SALIENT CHROMIUM STATISTICS[1]

(Metric tons, gross weight)

	2004	2005				
	January-December[2]	June	Second quarter	July	August	January-August[2]
Production:						
Stainless steel production[3]	2,000,000	200,000	562,000 [4]	137,000	167,000	1,520,000 [4]
Components of U.S. supply:						
Stainless steel scrap receipts	787,000	62,300	179,000	53,500	NA	419,000 [5]
Stainless steel scrap consumption	1,120,000	85,000	258,000	81,100		607,000 [5]
Imports for consumption:					NA	
Chromite ore	153,000	3,210	22,500	24,300	NA	86,400 [5]
Ferrochromium:						
More than 4% carbon	398,000	34,500	109,000	29,000	NA	255,000 [5]
More than 3% carbon but not more than 4% carbon	30	--	--	--	NA	-- [5]
More than 0.5%, but not more than 3% carbon	5,720	20	1,080	--	NA	3,510 [5]
Not more than 0.5% carbon	31,400	4,010	13,100	2,250	NA	26,500 [5]
Ferrochromium silicon	30,600	6,200	10,400	2,310	NA	22,900 [5]
Total ferroalloy imports	466,000	44,800	134,000	33,500	NA	308,000 [5]
Chromium metal[6]	9,650	1,070	3,100	945	NA	7,060 [5]
Stainless steel	811,000	63,900	196,000	60,200	NA	474,000 [5]
Stainless steel scrap	146,000	10,300	35,600	8,310	NA	75,700 [5]
Distribution of U.S. supply:						
Consumption, industry, chromium ferroalloys and metal	432,000	33,400	103,000	35,400	35,900	279,000
Exports:						
Chromite ore	43,100	516	12,500	1,670	NA	26,200 [5]
Chromium ferroalloys:						
High-carbon ferrochromium	6,580	633	1,790	23,500	NA	29,000 [5]
Low-carbon ferrochromium	1,410	143	322	1,220	NA	3,440 [5]
Ferrochromium silicon	1,150	--	--	48	NA	104 [5]
Total ferroalloy exports	9,140	776	2,120	24,800	NA	32,500 [5]
Chromium metal	931	91	240	51	NA	496 [5]
Stainless steel	323,000	34,600	111,000	27,700	NA	231,000 [5]
Stainless steel scrap	478,000	39,300	158,000	40,300	NA	337,000 [5]
Stocks at end of period:						
Consumer, industry, chromium ferroalloys and metal	XX	13,000	XX	12,000 [r]	13,000	XX
Government stockpile:						
Chromium ferroalloys	XX	513,000	XX	508,000	510,000	XX
Chromium metal	XX	6,190	XX	6,190	6,190	XX

[r]Revised. NA Not available. XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Data on stainless steel production reported by American Iron and Steel Institute; monthly, quarterly, and year-to-date production of stainless and heat-resisting raw steel.

[4]Includes revised data that is not broken out by specific month.

[5]Includes January through July data; August data not available.

[6]Includes waste and scrap and other.

TABLE 2
U.S. REPORTED CONSUMPTION AND STOCKS
OF CHROMIUM PRODUCTS IN 2005[1, 2]

(Metric tons, gross weight unless otherwise noted)

	July	August	January-August[3]
Consumption by end use:			
Alloy uses:			
Iron alloys:			
Steel:			
Carbon steel	318	318	2,970
High-strength low-alloy steel	623	626	5,020
Stainless and heat-resisting steel	30,500	31,100	240,000
Full alloy steel	1,610	1,610	13,000
Electrical steel	W	E	W
Tool steel	435	435	3,580
Unspecified steel	W	W	W
Cast irons	W	W	W
Superalloys	819	830	6,710
Other alloys[4]	64	48	498
Total	35,400	35,900	279,000
Total, chromium content	20,700	20,800	162,000
Consumption by material:			
Low-carbon ferrochromium	1,930	1,940	15,300
High-carbon ferrochromium	29,700	30,000	235,000
Ferrochromium silicon	3,050	3,230	23,800
Chromium metal	467	470	3,520
Chromite ore	W	W	W
Chromium-aluminum alloy	30	29	237
Other chromium materials	W	W	W
Total	35,400	35,900	279,000
Total, chromium content	20,700	20,800	162,000
Consumer stocks:			
Low-carbon ferrochromium	1,940	2,050	XX
High-carbon ferrochromium	8,600 r	9,160	XX
Ferrochromium silicon	1,220	1,590	XX
Chromium metal	132	136	XX
Chromite ore	W	W	XX
Chromium-aluminum alloy	24 r	32	XX
Other chromium materials	W	W	XX
Total	12,000 r	13,000	XX
Total, chromium content	7,070 r	7,560	XX

[r]Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes estimates.

[3]May include revised data.

[4]Includes welding and alloy hard-facing rods and materials; wear- and corrosion-resistant alloys; and aluminum, copper, magnetic, nickel, and other alloys.

TABLE 3
U.S. GOVERNMENT STOCKPILE INVENTORY
OF CHROMIUM MATERIALS[1, 2]

(Metric tons)

Period	Chromium ferroalloys		Chromium metal
	High-carbon ferro-chromium	Low-carbon ferro-chromium	
2004:			
August	412,000	206,000	6,670
September	408,000	192,000	6,670
October	404,000	192,000	6,670
November	398,000	191,000	6,670
December	398,000	191,000	6,670
2005:			
January	386,000	190,000	6,190
February	378,000	188,000	6,190
March	368,000	187,000	6,190
April	359,000	187,000	6,190
May	359,000	187,000	6,190
June	331,000	182,000	6,190
July	328,000	180,000	6,190
August	324,000	187,000	6,190

[1]Data are rounded to no more than three significant digits.

[2]These Government stocks are reported by the Defense National Stockpile Center in Inventory of Stockpile Materials R-1, which reports uncommitted inventory. Uncommitted inventory is that inventory for which there is no sales contract. Committed inventory is that inventory for which there is a sales contract, however, the material has not yet been shipped. For chromium materials, the R-1 report includes chromium materials that (1) meet specifications and are held in excess of goal and (2) do not meet specifications and are held in excess of goal. The R-1 report excludes chromium materials that are committed and awaiting shipment.

[3]The increase resulted from the reclassification of physical inventory from committed to uncommitted. It did not result from the addition of chromium materials to the stockpile.

Source: Defense National Stockpile Center.

TABLE 4

U.S. EXPORTS OF CHROMITE ORE, CHROMIUM FERROALLOYS, AND METAL[1]

Period	Chromite ore		Chromium ferroalloys[2]			Chromium metal[3]	
	Gross weight (metric tons)	Value (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value (thousands)	Gross weight (metric tons)	Value (thousands)
2004:							
July	8,180	$2,130	713	398	$1,000	100	$1,570
August	10,200	2,680	533	322	685	93	1,510
September	2,750	1,590	706	401	876	53	1,290
October	823	270	565	347	799	58	1,190
November	507	197	616	398	843	46	1,020
December	771	231	639	388	897	51	657
January-December	43,100	10,400	9,140	5,320	12,000	931	17,600
2005:							
January	2,550	618	427	257	610	103	1,070
February	1,540	404	2,150	1,330	2,910	35	796
March	7,910	1,310	3,050	1,850	4,070	66	983
April	6,930	1,820	686	419	913	85	1,580
May	5,040	923	653	402	804	64	1,190
June	516	190	776	486	1,010	91	1,520
July	1,670	697	24,800	16,600	23,800	51	781
January-July	26,200	5,960	32,500	21,300	34,200	496	7,920

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes low-, medium-, and high-carbon ferrochromium and ferrochromium silicon.

[3]Includes chromium metal waste and scrap and unwrought powders.

Source: U.S. Census Bureau.

TABLE 5

U.S. IMPORTS FOR CONSUMPTION OF CHROMITE ORE, FERROCHROMIUM, AND CHROMIUM METAL[1]

(Metric tons)

	2004	2005		
	January-December[2]	June	July	January-July[2]
Chromite ore:				
More than 40% but less than 46% chromic oxide:				
Gross weight	1,690	88	144	740
Chromic oxide content	761	40	66	338
46% or more chromic oxide:				
Gross weight	151,000	3,130	24,100	85,700
Chromic oxide content	71,600	1,450	11,300	40,100
Total, all grades:				
Gross weight	153,000	3,210	24,300	86,400
Chromic oxide content	72,400	1,490	11,300	40,500
Ferrochromium:				
Low-carbon:[3]				
Not more than 0.5%:				
Gross weight	31,400	4,010	2,250	26,500
Chromium content	21,100	2,810	1,570	18,200
More than 0.5% but not more than 3%:				
Gross weight	5,720	20	--	3,510
Chromium content	3,830	12	--	2,280
Total, low-carbon:				
Gross weight	37,100	4,030	2,250	30,000
Chromium content	24,900	2,820	1,570	20,500
Medium-carbon:[4]				
Gross weight	30	--	--	--
Chromium content	16	--	--	--
High-carbon:[5]				
Gross weight	398,000	34,500	29,000	255,000
Chromium content	223,000	21,300	14,600	148,000
Total, all grades:				
Gross weight	435,000	38,600	31,200	285,000
Chromium content	248,000	24,200	16,100	169,000
Chromium metal:				
Unwrought powders	1,350	85	126	549
Waste and scrap	94	--	2	14
Other than waste and scrap and unwrought powders	8,200	981	817	6,500
Total, all grades	9,650	1,070	945	7,060

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Ferrochromium containing not more than 3% carbon.

[4]Ferrochromium containing more than 3% carbon but not more than 4% carbon.

[5]Ferrrochromium containing more than 4% carbon.

Source: U.S. Census Bureau.

TABLE 6

U.S. IMPORTS FOR CONSUMPTION OF FERROCHROMIUM IN 2005, BY GRADE AND BY COUNTRY[1]

Grade and country	July			January-July[2]		
	Gross weight (metric tons)	Chromium content (metric tons)	Value[3] (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value[3] (thousands)
High-carbon ferrochromium:[4]						
Australia	--	--	--	13	9	$11
China	--	--	--	13	8	11
Kazakhstan	40	28	$45	64,000	44,400	67,000
Russia	1,020	673	710	27,700	18,300	23,900
South Africa	27,900	13,900	18,000	129,000	65,300	82,800
Zimbabwe	--	--	--	34,300	20,400	27,800
Total	29,000	14,600	18,700	255,000	148,000	202,000
Low-carbon ferrochromium:[5]						
More than 0.5% but not more than 3% carbon:						
India	--	--	--	20	13	17
Kazakhstan	--	--	--	850	587	1,350
Russia	--	--	--	1,830	1,240	2,030
South Africa	--	--	--	810	446	905
Total	--	--	--	3,510	2,280	4,300
Not more than 0.5% carbon:						
China	--	--	--	24	16	53
France	--	--	--	4	3	8
Germany	338	239	699	3,090	2,170	5,890
Japan	280	196	829	1,480	1,030	4,010
Kazakhstan	--	--	--	2,100	1,430	3,180
Russia	1,630	1,130	2,370	19,600	13,500	28,600
South Africa	--	--	--	208	105	93
Turkey	--	--	--	4	2	8
Total	2,250	1,570	3,900	26,500	18,200	41,800
All grades:						
Australia	--	--	--	13	9	11
China	--	--	--	37	25	64
France	--	--	--	4	3	8
Germany	338	239	699	3,090	2,170	5,890
India	--	--	--	20	13	17
Japan	280	196	829	1,480	1,030	4,010
Kazakhstan	40	28	45	66,900	46,400	71,500
Russia	2,650	1,800	3,080	49,100	32,900	54,500
South Africa	27,900	13,900	18,000	130,000	65,800	83,800
Turkey	--	--	--	4	2	8
Zimbabwe	--	--	--	34,300	20,400	27,800
Total	31,200	16,100	22,600	285,000	169,000	248,000

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

[4]Ferrochromium containing more than 4% carbon.

[5]Ferrochromium containing not more than 3% carbon.

Source: U.S. Census Bureau.

TABLE 7

U.S. IMPORTS FOR CONSUMPTION OF CHROMIUM METAL IN 2005, BY GRADE AND BY COUNTRY[1]

Grade and country	July		January-July[2]	
	Gross weight (metric tons)	Value[3] (thousands)	Gross weight (metric tons)	Value[3] (thousands)
Unwrought powders:				
China	104	$658	171	$1,190
France	--	--	6	78
Germany	--	--	13	147
Japan	22	769	200	4,750
Korea, Republic of	--	--	1	22
Malaysia	--	--	1	6
Russia	--	--	100	518
Spain	--	--	57	248
Sweden	--	--	(4)	3
United Kingdom	(4)	69	1	283
Total	126	1,500	549	7,240
Waste and scrap:				
Germany	1	19	4	70
Japan	(4)	9	9	128
Singapore	1	5	1	5
Total	2	32	14	203
Other than waste and scrap and unwrought powders:				
Austria	--	--	(4)	4
China	301	1,650	1,610	7,940
France	218	1,910	1,530	12,200
Germany	--	--	29	247
India	--	--	1	5
Japan	--	--	30	1,060
Russia	139	815	2,210	21,300
United Kingdom	159	1,010	1,080	6,900
Total	817	5,390	6,500	49,700
All grades:				
Austria	--	--	(4)	4
China	405	2,300	1,780	9,130
France	218	1,910	1,530	12,300
Germany	1	19	47	465
India	--	--	1	5
Japan	22	778	239	5,930
Korea, Republic of	--	--	1	22
Malaysia	--	--	1	6
Russia	139	815	2,310	21,900
Singapore	1	5	1	5
Spain	--	--	57	248
Sweden	--	--	(4)	3
United Kingdom	159	1,080	1,090	7,180
Total	945	6,910	7,060	57,200

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

[4]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 8

U.S. TRADE OF STAINLESS STEEL, BY PRODUCT, IN 2005[1]

Stainless steel product	July		January-July	
	Gross weight (metric tons)	Value[2] (thousands)	Gross weight (metric tons)	Value[2] (thousands)
Exports:				
Ingot	565	$2,880	4,900	$26,000
Flat-rolled (width > 600 mm)	11,400	32,300	104,000	288,000
Flat-rolled (width < 600 mm)	8,990	32,600	75,300	271,000
Bars and rods in irregular coils	394	1,310	3,430	10,300
Other bars and rods	1,730	12,300	16,600	92,600
Wire	404	3,320	3,330	25,400
Tubes, pipes, hollow profiles	4,270	22,400	22,900	125,000
Total	27,700	107,000	231,000	838,000
Stainless steel scrap	40,300	50,600	337,000	377,000
Grand total	68,000	158,000	568,000	1,220,000
Imports:				
Ingot	11,100	32,000	99,000	274,000
Flat-rolled (width > 600 mm)	22,100	61,400	176,000	476,000
Flat-rolled (width < 600 mm)	3,810	16,600	25,500	101,000
Bars and rods in irregular coils	2,370	6,690	25,500	72,500
Other bars and rods	9,990	38,400	64,400	249,000
Wire	3,290	14,000	24,100	105,000
Tubes, pipes, hollow profiles	7,540	43,900	59,300	324,000
Total	60,200	213,000	474,000	1,600,000
Stainless steel scrap	8,310	10,600	75,700	87,900
Grand total	68,600	224,000	550,000	1,690,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Export value is free alongside ship (f.a.s.). Import value is Customs import value, which generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

Source: U.S. Census Bureau.

TABLE 9
CHROMITE ORE PRICES

(Dollars per metric ton, gross weight unless otherwise noted)

Week ending	Turkey[1]		South Africa[2]				Philippines[3]
	1	2	1	2	3	4	
2004:							
07/02	115	130	80 - 110	120 - 140	100 - 120	70 - 90	125 - 145
07/09	115	130					
07/16	115	130					
07/23	120	135					
07/30	120	135					
08/06	120	135	85 - 120	125 - 150	100 - 120	75 - 95	125 - 145
08/13	120	135					
08/20	120	135					
08/27	120	135					
09/03	120	135	85 - 120	125 - 150	100 - 120	75 - 95	125 - 145
09/10	120	135					
09/17	120	135					
09/24	120	135					
10/01	120	135	85 - 120	125 - 150	100 - 120	75 - 95	125 - 145
10/08	120	135					
10/15	120	135					
10/22	120	135					
10/29	120	135					
11/05	120	135	85 - 120	125 - 150	100 - 120	75 - 95	125 - 145
11/12	120	135					
11/19	120	135					
11/26	120	135					
12/03	120	135	85 - 125	130 - 150	100 - 120	75 - 95	125 - 145
12/10	130	145					
12/17	130	145					
12/24	130	145					
12/31	130	145					
2005:							
01/07	130	145	75 - 125	120 - 140	100 - 120	70 - 80	125 - 145
01/14	130	145					
01/21	140	155					
01/28	140	155					
02/04	140	155	125 - 150	170 - 190	100 - 120	80 - 90	125 - 145
02/11	140	155					
02/18	150	175					
02/25	165	190					
03/04	175	195	125 - 150	170 - 190	100 - 120	80 - 90	125 - 145
03/11	175	195					
03/18	175	195					
03/25	175	195					
04/01	175	195	125 - 150	175 - 195	100 - 120	85 - 95	125 - 145
04/08	180	200					
04/15	180	200					
04/22	180	200					
04/29	180	200	125 - 150	175 - 195	100 - 120	85 - 95	125 - 145
05/06	180	200					
05/13	180	200					
05/20	180	200					
05/27	180	200					
06/03	175	195	125 - 145	175 - 205	100 - 120	85 - 100	125 - 145
06/10	175	195					
06/17	175	195					
06/24	155	175					

See footnotes at end of table.

TABLE 9--Continued
CHROMITE ORE PRICES

(Dollars per metric ton, gross weight unless otherwise noted)

Week ending	Turkey[1]		South Africa[2]				Philippines[3]
	1	2	1	2	3	4	
2005:							
07/01	150	170	120 - 140	170 - 200	100 - 120	80 - 100	125 - 145
07/08	150	170					
07/15	150	170					
07/22	150	170					
07/29	140	160					
08/05	140	160	120 - 140	176 - 209	100 - 120	80 - 100	125 - 145
08/12	130	150					
08/19	120	140					
08/26	120	140					
09/02	120	140	115 - 135	175 - 205	100 - 120	70 - 100	120 - 145
09/09	120	140					
09/16	110	130					
09/23	110	130					
09/30	110	130					

[1]Turkey 1 (T1) is called 38% - 40% Cr_2O_3 by Ryan's Notes (RN); T2 is called 44% Cr_2O_3 by RN.

[2]South Africa 1 (SA1) is called chemical grade, 46% Cr_2O_3, wet bulk, free on board (f.o.b.) by Industrial Minerals (IM); SA2 is called foundry grade, 46% Cr_2O_3, wet bulk, f.o.b. by IM; SA3 is called refractory grade, 46% Cr_2O_3, wet bulk, f.o.b. by IM; SA4 is called metallurgical grade, friable lumpy, 40% Cr_2O_3 by IM.

[3]Philippines is called refractory grade, f.o.b. by IM.